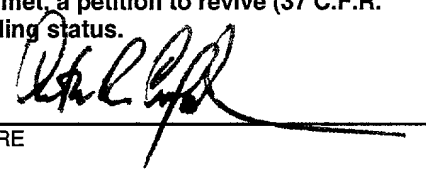


FORM PTO-1390 (REV 11-98)	U.S. DEPARTMENT OF COMMERCE PATENT AND TRADEMARK OFFICE	ATTORNEY'S DOCKET NUMBER 35-201
TRANSMITTAL LETTER TO THE UNITED STATES DESIGNATED/ELECTED OFFICE (DO/EO/US) CONCERNING A FILING UNDER 35 U.S.C. 371		U.S. APPLICATION NO. (If known, see 37 C.F.R. 1.5) 09/287099 Unknown
INTERNATIONAL APPLICATION NO. PCT/EP99/01852	INTERNATIONAL FILING DATE 17 March 1999	PRIORITY DATE CLAIMED 19 September 1998
TITLE OF INVENTION OPTICAL DATA STORAGE		
APPLICANT(S) FOR DO/EO/US LEIBER et al.		
Applicant herewith submits to the United States Designated/Elected Office (DO/EO/US) the following items and other information:		
1. <input checked="" type="checkbox"/> This is a FIRST submission of items concerning a filing under 35 U.S.C. 371. 2. <input type="checkbox"/> This is a SECOND or SUBSEQUENT submission of items concerning a filing under 35 U.S.C. 371. 3. <input checked="" type="checkbox"/> This is an express request to begin national examination procedures (35 U.S.C. 371(f) at any time rather than delay examination until the expiration of the applicable time limit set in 35 U.S.C. 371(b) and PCT Articles 22 and 39(1). 4. <input checked="" type="checkbox"/> A proper Demand for International Preliminary Examination was made by the 19 th month from the earliest claimed priority date. 5. A copy of the International Application as filed (35 U.S.C. 371(c)(2)). a. <input type="checkbox"/> is transmitted herewith (required only if not transmitted by the International Bureau). b. <input checked="" type="checkbox"/> has been transmitted by the International Bureau. c. <input type="checkbox"/> is not required, as the application was filed in the United States Receiving Office (RO/US). 6. <input checked="" type="checkbox"/> A translation of the International Application into English (35 U.S.C. 371(c)(2))(10 pages) with Certification of Translation. 7. <input checked="" type="checkbox"/> Amendments to the claims of the International Application under <u>PCT Article 34</u> . a. <input type="checkbox"/> are transmitted herewith (required only if not transmitted by the International Bureau). b. <input checked="" type="checkbox"/> have been transmitted by the International Bureau. c. <input type="checkbox"/> have not been made; however, the time limit for making such amendments has NOT expired. d. <input type="checkbox"/> have not been made and will not be made. 8. <input checked="" type="checkbox"/> A translation of the amendments to the claims under <u>PCT Article 34</u> (3 pages) with Certification of Translation. 9. <input type="checkbox"/> An oath or declaration of the inventor(s) (35 U.S.C. 371(c)(4)). 10. <input type="checkbox"/> A translation of the annexes to the International Preliminary Examination Report under PCT Article 36 (35 U.S.C. 371(c)(5)). Items 11. To 16. Below concern document(s) or information included: 11. <input type="checkbox"/> An Information Disclosure Statement under 37 C.F.R. 1.97 and 1.98. 12. <input type="checkbox"/> An assignment document for recording. A separate cover sheet in compliance with 37 C.F.R. 3.28 and 3.31 is included. 13. <input checked="" type="checkbox"/> A FIRST preliminary amendment. <input type="checkbox"/> A SECOND or SUBSEQUENT preliminary amendment. 14. <input type="checkbox"/> A substitute specification. 15. <input type="checkbox"/> A change of power of attorney and/or address letter. 16. <input checked="" type="checkbox"/> Other items or information. PTO-1449/ International Search Report <input type="checkbox"/> This application is entitled to "Small entity" status. <input type="checkbox"/> "Small entity" statement attached.		

U.S. APPLICATION NO. (If known, use 37 C.F.R. 1.55) Unknown		INTERNATIONAL APPLICATION NO. PCT/EP99/01852		ATTORNEY'S DOCKET NUMBER 35-201	
17. <input checked="" type="checkbox"/> The following fees are submitted:				CALCULATIONS PTO USE ONLY	
BASIC NATIONAL FEE (37 C.F.R. 1.492(a)(1)-(5): -- Neither international preliminary examination fee (37 C.F.R. 1.482) nor international search fee (37 C.F.R. 1.445(a)(2)) paid to USPTO and International Search Report not prepared by the EPO or JPO\$1000.00 -- International preliminary examination fee (37 C.F.R. 1.482) not paid to USPTO but International Search Report prepared by the EPO or JPO\$860.00 -- International preliminary examination fee (37 C.F.R. 1.482) not paid to USPTO but international search fee (37 C.F.R. 1.445(a)(2)) paid to USPTO\$710.00 -- International preliminary examination fee paid to USPTO (37 C.F.R. 1.482) but all claims did not satisfy provisions of PCT Article 33(1)-(4)\$690.00 -- International preliminary examination fee paid to USPTO (37 C.F.R. 1.482) and all claims satisfied provisions of PCT Article 33(1)-(4)\$100.00 ENTER APPROPRIATE BASIC FEE AMOUNT =				\$	860.00
				\$	130.00
				Surcharge of \$130.00 for furnishing the oath or declaration later than <input type="checkbox"/> 20 <input checked="" type="checkbox"/> 30 months from the earliest claimed priority date (37 C.F.R. 1.492(e)).	
CLAIMS	NUMBER FILED	NUMBER EXTRA	RATE		
Total Claims	17	-20 =	0	X \$18.00	\$ 0.00
Independent Claims	1	-3 =	0	X \$80.00	0.00
MULTIPLE DEPENDENT CLAIMS(S) (if applicable)				\$270.00	\$ 0.00
TOTAL OF ABOVE CALCULATIONS =					\$ 990.00
Reduction by 1/2 for filing by small entity, if applicable. Small entity status must also be asserted. (Note 37 C.F.R. 1.9, 1.27, 1.28).					0.00
SUBTOTAL =					\$ 990.00
Processing fee of \$130.00, for furnishing the English Translation later than <input type="checkbox"/> 20 <input type="checkbox"/> 30 months from the earliest claimed priority date (37 C.F.R. 1.492(f)).				+	0.00
TOTAL NATIONAL FEE =					\$ 990.00
Fee for recording the enclosed assignment (37 C.F.R. 1.21(h)). The assignment must be accompanied by an appropriate cover sheet (37 C.F.R. 3.28, 3.31). \$40.00 per property				+	0.00
Fee for Petition to Revive Unintentionally Abandoned Application (\$1240.00 - Small Entity = \$620.00)					0.00
TOTAL FEES ENCLOSED =					\$ 990.00
				Amount to be:	
				refunded	\$
				Charged	\$
<input checked="" type="checkbox"/> A check in the amount of \$990.00 to cover the above fees is enclosed. <input type="checkbox"/> Please charge my Deposit Account No. 14-1140 in the amount of \$_____ to cover the above fees. A duplicate copy of this form is enclosed. <input checked="" type="checkbox"/> The Commissioner is hereby authorized to charge any additional fees which may be required, or credit any overpayment to Deposit Account No. 14-1140. A duplicate copy of this form is enclosed. d. <input type="checkbox"/> The entire content of the foreign application(s), referred to in this application is/are hereby incorporated by reference in this application. NOTE: Where an appropriate time limit under 37 C.F.R. 1.494 or 1.495 has not been met, a petition to revive (37 C.F.R. 1.137(a) or (b)) must be filed and granted to restore the application to pending status.					
SEND ALL CORRESPONDENCE TO: NIXON & VANDERHYE P.C. 1100 North Glebe Road, 8 th Floor Arlington, Virginia 22201 Telephone: (703) 816-4000					
				 SIGNATURE	
				Arthur R. Crawford NAME	
				25,327 REGISTRATION NUMBER	
				March 14, 2001 Date	

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Patent Application of

LEIBER et al

Atty. Ref.: 35-201

Serial No. Unknown

Group:

Filed: March 14, 2001

Examiner:

For: OPTICAL DATA STORAGE

* * * * *

March 14, 2001

Assistant Commissioner for Patents
Washington, DC 20231

Sir:

PRELIMINARY AMENDMENT

In order to place the above-identified application in better condition for examination,
please amend the application as follows:

IN THE CLAIMS

Please cancel claims 1-17 without prejudice or disclaimer and add claims 18-34 as
follows:

- 18. A data storage medium comprising an information carrier which is wound in a spiral fashion
and on which information units are provided which can be read optically, the information
carrier being optically transparent and the information units being readable through a plurality
of information carrier layers (10), wherein the data storage medium is adapted to be read in
the wound state.
19. The data storage medium as claimed in claim 18, wherein the information carrier is a
transparent polymer film (11).

20. The data storage medium as claimed in claim 19, wherein PMMA or BOPP is used as polymer film (11).
21. The data storage medium as claimed in claim 19, wherein between the polymer film layers (10) a transparent adhesion agent (12) is used, in particular a pressure sensitive adhesive.
22. The data storage medium as claimed in claim 21, wherein the adhesion agent (12) possesses a refractive index which differs little from the refractive index of the information carrier.
23. The data storage medium as claimed in claim 22, wherein the difference in the refractive indices of information carrier and adhesion agent (12) is so little that the reflection at the boundary is less than 4 %, preferably less than 1 %, and, with very particular preference, such that the difference in the refractive indices is less than 0.005.
24. The data storage medium as claimed in claim 19, wherein the polymer film (11) has a thickness of between 10 and 100 μm , preferably around or below 50 μm , with particular preference around 35 μm .
25. The data storage medium as claimed in claim 21, wherein the adhesion agent (12) has a film thickness of between 1 and 40 μm , preferably below 25 μm , in particular around 2 μm .
26. The data storage medium as claimed in claim 18, wherein the data storage medium has an optically transparent winding core which is formed in particular as a transparent hollow cylinder.
27. The data storage medium as claimed in claim 18, wherein the data storage medium is preformatted, the formatting being formed by and/or by means of the spiral layers (10).
28. The data storage medium, in particular as claimed in claim 18, wherein the optical data storage medium comprises as information carrier a transparent polymer film (11) which is pretensioned, especially in two planes.
29. The data storage medium as claimed in claim 18, wherein the information units, or some of them, can be produced by local thermal heating of the information carrier.

30. The data storage medium as claimed in claim 29, wherein, at the location of the thermal heating, the pretensioned information carrier has a locally changed optical density, in particular with a change in refractive index of about 0.2.
31. The data storage medium as claimed in claim 18, wherein the information units are formed by changing the optical properties in a region of less than 1 μm in diameter.
32. The data storage medium as claimed in claim 18, wherein the information units are designed for the storage of one of two states.
33. The data storage medium as claimed in claim 18, wherein the information units are designed in such a way that, at least at some points, no saturation of the information carrier change has taken place, and the information units are able to adopt more than two different states.
34. The use of a data storage medium in a data drive for a data carrier, as set forth in claim 18, in which a relative movement takes place between information units and reading head (2), with the data carrier generally being stationary and/or the reading head (2), especially in the central region of the wound body, rotating.--

REMARKS

The above amendments are made to place the claims in a more traditional format.

Respectfully submitted,

NIXON & VANDERHYE P.C.

By: 

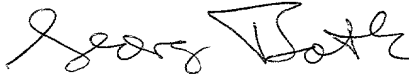
Arthur R. Crawford
Reg. No. 25,327

ARC:ms
1100 North Glebe Road, 8th Floor
Arlington, VA 22201-4714
Telephone: (703) 816-4000
Facsimile: (703) 816-4100

Certification of Translation

I, Georg Both of UEXKÜLL & STOLBERG, Patent Attorneys in Hamburg, Germany, do hereby certify that I am conversant with the English and German languages and am a competent translator thereof, and I further certify that to the best of my knowledge and belief the foregoing is a true and correct translation of the document in the English language attached hereto, namely International Patent Application No. PCT/EP99/01852 filed March 17, 1999.

Hamburg, February 27, 2001



Georg Both

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Optical data storage medium

The present invention relates to an optical data storage medium.

5

Optical data storage media are known. For instance, flat round data carriers in the form of CD-ROMs, audio CDs, etc., are on the market. Also known are flat round data carriers such as DVDs, in which two layers containing optical information are arranged above one another and may be read selectively.

10

US 5,109,374 also discloses an optical data storage medium, but discloses only the arrangement of a data carrier in one layer on a cylinder.

15

The object of the invention is to provide an optical data storage medium which has a high capacity for accommodating data, which is easy to write to and read from again, which ensures that the data present on it can be stored for a long time, and which is simple in construction and inexpensive to produce.

20

This object is achieved by means of a data storage medium as described in the main claim. The subclaims relate to preferred embodiments of the data storage medium.

25

The invention accordingly provides a data storage medium comprising an information carrier which is wound in a spiral fashion and on which information units are provided which can be read optically. The information carrier is optically transparent. Governed by the winding of the information carrier, the data storage medium of the invention has a substantially round form (preferably a roll).

30

In a first advantageous embodiment of the data storage medium of the invention, the information units can be read through a plurality of information carrier layers; in particular, the data storage medium can be read in the wound state, i.e., through a plurality of wound layers - this is achieved by choosing a highly transparent information carrier.

35

The inventive choice of the information carrier and also the introduction and/or application of the information units result in a data carrier which constitutes a highly compact storage medium. Although clearly defined

40

wound layers can be written to and read from, a storage medium is obtained which allows volume storage. Accordingly, the disadvantages of the known flat data storage media are avoided by virtue of the spiral-type winding. Furthermore, in contrast, for instance, of a CD, it is unnecessary to provide a very large surface area.

The transparent wound body formed from the layers of the wound information carrier preferably comprises at least 10 layers and preferably has a diameter of from about 20 to 50 mm. The height of the wound cylinder may be, for example, around 19 mm. The number of winds may be, for example, between 10 and 30, although larger numbers may very well be realized.

The data storage medium may comprise an information carrier made from transparent polymer film, the use of PMMA (polymethyl methacrylate) or BOPP (biaxially oriented polypropylene) being a particular possibility.

If the data storage medium has a transparent adhesion agent between the polymer film layers, in particular a pressure sensitive adhesive, the effect is both to minimize interfacial reflections and to prevent unwanted unwinding. The adhesion film has - like the polymer film, preferably been freed from bubbles. In order to improve the optical transparency, it is desirable for the refractive index possessed by the adhesion agent to differ little from the refractive index of the information carrier. For instance, the difference in the refractive indices of information carrier and adhesion agent may be so little that the reflection at the boundary is less than 2%, preferably less than 0.1%. With particular preference, the difference in the refractive indices is less than 0.005. In that case, information units can be read effectively through more than twenty wound layers, without the need to give the information carrier film an antireflection coating.

If the polymer film has a thickness of between 10 and 100 μm , preferably around or below 50 μm , with particular preference around 35 μm , this ensures that the data on different wound layers are separate from one another which permits good resolution without the need for excessive volumes.

At the same time, the adhesion agent may also have a layer thickness of between 1 and 40 μm , preferably below 25 μm , in particular around 2 μm .

If the adhesion agent is also provided with an absorber for writing light, i.e., if it absorbs the energy required to write to the information units and transfers it to the polymer film for thermal structuring of the latter, a sufficiently large effect may be achieved by the stated layer thickness. The thickness is ideal for typical extents of focus in the material.

The data storage medium may have an optically transparent winding core, which is constructed in particular as a transparent hollow cylinder. Accordingly, the data storage medium becomes readable from the inside, which enables the optical system for writing and/or reading and/or rewriting to be arranged - in particular, in rotation - in the inside of the winding. Such an arrangement simplifies the production of the data storage medium insofar as it is necessary to balance out only the optical system, and not each individual data carrier. For balancing the reading optical system, there are preferably two diametrically opposing lens arrangements provided, between which, for instance, a central beam splitter unit for inward and outward irradiation of the light may be provided. These lenses may rotate together with the beam splitter. The first of these lenses may be envisaged for outer wound layers, the second for the inner wound units, thereby increasing the access speeds by reducing the extent of refocusing necessary.

The data storage medium is preferably preformatted with formatting formed by and/or by means of the spiral layers. Formatting may also be introduced during or prior to winding in or on the information carrier during production, for example, by hot embossing and so on.

With particular preference, the data storage medium comprises an information carrier possessing a high intrinsic energy stored in the material: for example, a polymer film which is pretensioned, especially in two planes. This is particularly advantageous insofar as it is then possible to obtain a large change in material through reformation by depositing only a small quantity of energy, so that weak optical beams are sufficient for very large changes in material which are easy to read.

It is possible for the information units, or some of them, to be formed by local thermal heating of the information carrier. In the case of a pretensioned polymer film, the thermal heating changes the optical path length in the material and/or the refractive index or the reflectivity. This

change is readily detectable from the backreflection intensity of an inwardly irradiated beam of light emitted, in particular, from a conventional semiconductor laser.

- 5 Preferably, at the site of thermal heating, the pretensioned information carrier has a locally changed optical density, in particular with a change in refractive index of about 0.2. It is further preferred for the information units to be formed by changing the optical properties in a region of less than 1 μm in diameter. This is readily possible with commercial semiconductor
10 diodes and optical systems.

- The information units may store data in binary form; a further possibility is that of storage in a plurality of gray stages. This is possible if the polymer film may be specifically altered in a defined manner without saturation, as
15 is possible in the case of commercially customary BOPP polymer film with adhesion layers in between, when using, for example, the adhesive tape roll "tesafilm kristallklar"®

- The information units are preferably designed in such a way that, at least
20 at some points, no saturation of the information carrier change has taken place, and the information units are able to adopt more than two different states.

- With particular advantage, the data storage medium may be used in a data
25 drive for a data carrier in which a relative movement takes place between information units and reading head, with the data carrier generally being stationary and/or the reading head, especially in the central region of the wound body, rotating and moving back and forth axially in order to find a predetermined track.

- 30 The present invention is described below by means of an example, with reference to a drawing, without wishing to restrict the invention unnecessarily. In this drawing,

- 35 Figure 1 shows a data storage medium of the present invention in a schematic perspective representation.

According to the figure, the data storage medium 1 comprises a number of wound layers 10 of polymer film 11, which has been pretensioned in both

directions prior to winding. The polymer film 11 consists of BOPP and has a thickness of 35 μm . Arranged between the layers 10 is an adhesion agent 12 (acrylic dispersion adhesive), free from air bubbles and having a thickness of 23 μm . The transparent wound body (data storage medium 1) comprises twenty layers 10 and has a diameter of about 30 mm. The height of the wound cylinder is 19 mm. The wound body is available commercially from the company Beiersdorf under the designation "tesafilm kristallklar"®.

- 10 Arranged in the interior of the wound core carrier is an optical system 2, with which a beam of light of wavelength 630 nm or 532 nm, for example, is focused onto the individual wound layers 10. Furthermore, the optical system 2 may be moved back and forth axially. The optical system 2 is designed so that, on the one hand, energy can be deposited and, on the other hand, the light intensity reflected at a selectable point of a desired wound layer 10 can be determined. In order to be able to address all possible points of a wound layer 10, the optical system 2 rotates in the interior of the wound body, with a balancing system (not shown in detail) permitting high speeds of rotation. A servo control allows focusing onto different wound layers 10.

Using this system, data are stored and read as follows:

- 25 First of all, with an power of 1 mW focused on a spot of less than 1 μm (one micrometer), a certain quantity of energy is deposited in the polymer film, the deposition of the energy taking place directly in the polymer film or indirectly by heating of the adhesion agent. This deposited energy alters the optical properties of the polymer film, which undergoes deformation from the pretensioned state.

- 30 Subsequently, the change in optical properties may be read out by measuring the reflection intensity using the same laser and reduced inward irradiation power.

- 35 A data storage medium constructed in this way is compact, is inexpensive with regard to the data carriers and permits a storage density of at least 10 gigabytes per roll. Higher storage densities result if the choices of film thickness and of material are improved.

It is possible to record formatting information and/or other desired information on the data storage medium prior to winding.

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English translation of claims annexed to the International Preliminary Examination Report

Amended Claims

1. A data storage medium comprising an information carrier which is wound in a spiral fashion and on which information units are provided which can be read optically, the information carrier being optically transparent and the information units being readable through a plurality of information carrier layers (10), characterized in that the data storage medium is adapted to be read in the wound state.
2. The data storage medium as claimed in claim 1, characterized in that the information carrier is a transparent polymer film (11).
3. The data storage medium as claimed in claim 2, characterized in that PMMA or BOPP is used as polymer film (11).
4. The data storage medium as claimed in claim 2 or 3, characterized in that between the polymer film layers (10) a transparent adhesion agent (12) is used, in particular a pressure sensitive adhesive.
5. The data storage medium as claimed in claim 4, characterized in that the adhesion agent (12) possesses a refractive index which differs little from the refractive index of the information carrier.
6. The data storage medium as claimed in claim 5, characterized in that the difference in the refractive indices of information carrier and adhesion agent (12) is so little that the reflection at the boundary is less than 4 %, preferably less than 1 %, and, with very particular preference, such that the difference in the refractive indices is less than 0.005.

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7. The data storage medium as claimed in any of claims 2 to 6, characterized in that the polymer film (11) has a thickness of between 10 and 100 μm , preferably around or below 50 μm , with particular preference around 35 μm .
8. The data storage medium as claimed in any of claims 4 to 7, characterized in that the adhesion agent (12) has a film thickness of between 1 and 40 μm , preferably below 25 μm , in particular around 2 μm .
9. The data storage medium as claimed in any of claims 1 to 8, characterized in that the data storage medium has an optically transparent winding core which is formed in particular as a transparent hollow cylinder.
10. The data storage medium as claimed in any of claims 1 to 9, characterized in that the data storage medium is preformatted, the formatting being formed by and/or by means of the spiral layers (10).
11. The data storage medium, in particular as claimed in any of claims 1 to 10, characterized in that the optical data storage medium comprises as information carrier a transparent polymer film (11) which is pretensioned, especially in two planes.
12. The data storage medium as claimed in any of claims 1 to 11, characterized in that the information units, or some of them, can be produced by local thermal heating of the information carrier.
13. The data storage medium as claimed in claim 12, characterized in that, at the location of the thermal heating, the pretensioned information carrier has a locally changed optical density, in particular with a change in refractive index of about 0.2.

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14. The data storage medium as claimed in any of claims 1 to 13, characterized in that the information units are formed by changing the optical properties in a region of less than 1 μm in diameter.
15. The data storage medium as claimed in any of claims 1 to 14, characterized in that the information units are designed for the storage of one of two states.
16. The data storage medium as claimed in any of claims 1 to 14, characterized in that the information units are designed in such a way that, at least at some points, no saturation of the information carrier change has taken place, and the information units are able to adopt more than two different states.
17. The use of a data storage medium in a data drive for a data carrier, as set forth in any of the preceding claims, in which a relative movement takes place between information units and reading head (2), with the data carrier generally being stationary and/or the reading head (2), especially in the central region of the wound body, rotating.

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Abstract

A data storage medium (1) comprises an information carrier which is wound in a spiral fashion and on which information units are provided which can be read optically. The information carrier is optically transparent.

(Figure 1)

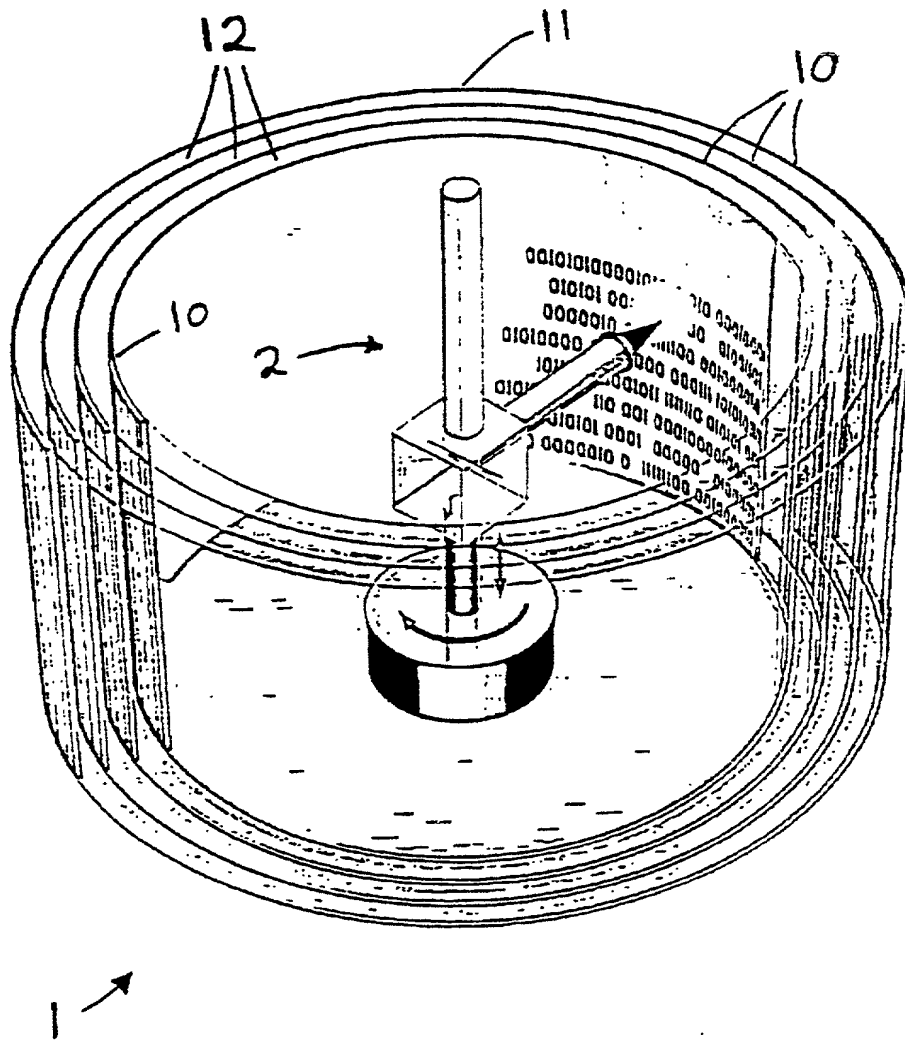


Fig. 1

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P56639 Bo/HMNixon & Vanderhye P.C. (10/99)
(Domestic Non-Assigned/Foreign) Page 1

RULE 63 (37 C.F.R. 1.63)
INVENTORS DECLARATION FOR PATENT APPLICATION
IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

As a below named inventor, I hereby declare that my residence, mailing address and citizenship are as stated below next to my name, and I believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled:

OPTICAL DATA STORAGE

the specification of which (check applicable box(es)):

☐ is attached hereto
☐ was filed on _____ as U.S. Application Serial No. _____ (Atty Dkt. No. 35-201)
☒ was filed as PCT International application No. PCT/EP99/01852 on 17 March 1999
 and (if applicable to U.S. or PCT application) was amended on 25 September 2000

I hereby state that I have reviewed and understand the contents of the above identified specification, including the claims, as amended by any amendment referred to above. I acknowledge the duty to disclose to the Patent Office all information known to me to be material to patentability as defined in 37 C.F.R. 1.56. I hereby claim foreign priority benefits under 35 U.S.C. 119/365 of any foreign application(s) for patent or inventor's certificate listed below and have also identified below any foreign application for patent or inventor's certificate having a filing date before that of the application on which priority is claimed or, if no priority is claimed, before the filing date of this application:

Priority Foreign Application(s):

Application Number	Country	Day/Month/Year Filed
298 16 802.2	DE	19 September 1998

I hereby claim the benefit under 35 U.S.C. §119(e) of any United States provisional application(s) listed below.

Application Number	Date/Month/Year Filed
--------------------	-----------------------

I hereby claim the benefit under 35 U.S.C. 120/365 of all prior United States and PCT international applications listed above or below:

Prior U.S./PCT Application(s):

Application Serial No.	Day/Month/Year Filed	Status: patented pending, abandoned
PCT/EP99/01852	17 March 1999	

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon. And on behalf of the owner(s) hereof, I hereby appoint **NIXON & VANDERHYE P.C., 1100 North Glebe Rd., 8th Floor, Arlington, VA 22204-4714, telephone number (703) 816-4000** (to whom all communications are to be directed), and the following attorneys thereof (of the same address) individually and collectively owners'/owners' attorneys to prosecute this application and to transact all business in the Patent and Trademark Office connected therewith and with the resulting patent: Larry S. Nixon, 25640; Arthur R. Crawford, 25327; James T. Hosmer, 30184; Robert W. Farris, 31352; Richard G. Besha, 22770; Mark E. Nusbaum, 32348; Michael J. Keenan, 32106; Bryan H. Davidson, 30251; Stanley C. Spooner, 27393; Leonard C. Mitchard, 29009; Duane M. Byers, 33363; Jeffery H. Nelson, 30481; John R. Lastova, 33149; H. Warren Burnam, Jr., 29366; Mary J. Wilson, 32955; J. Scott Davidson, 33489; Alan M. Kagen, 36178; Robert A. Molan, 29834; B. J. Sadoff, 36663; James D. Berquist, 34776; Updeep S. Gill, 37334; Michael J. Shea, 34725; Donald L. Jackson, 41090; Michelle N. Lester, 32331; Frank P. Presta, 19828; Joseph S. Presta, 35329; Joseph A. Rhoads, 37515; Raymond Y. Mah, 41428; Chris Comuntzis, 31097. I also authorize Nixon & Vanderhye to delete any attorney names/numbers no longer with the firm and to act and rely solely on instructions directly communicated from the person, assignee, attorney, firm, or other organization sending instructions to Nixon & Vanderhye on behalf of the owner(s).

1.	Inventor's Signature: <u><i>Joachim Leiber</i></u>	Date: <u>3. April 2001</u>
	Inventor: <u>LEIBER</u> (first) <u>MI</u> <u>Jörn</u> (last) <u>Germany</u> (citizenship)	
	Residence: (city) <u>Hollensleben</u> (state/country) <u>Germany</u>	
	Mailing Address: <u>Mittelstrasse 4, Hollensleben, Germany</u> <u>An der Lohbeck 6b, Hamburg</u> <u>Leiber</u>	
	(Zip Code) <u>05324</u> <u>0-22529</u>	
2.	Inventor's Signature: <u><i>Steffen Nochte</i></u>	Date: <u>20.4.2001</u>
	Inventor: <u>Steffen</u> (first) <u>MI</u> <u>NOCHTE</u> (last) <u>Germany</u> (citizenship)	
	Residence: (city) <u>Hirschberg</u> (state/country) <u>Germany</u>	
	Mailing Address: <u>Bräuelauer Strasse 8, Hirschberg, Germany</u> <u>Leberstr. 51, Weinheim, Germany</u> <u>Nochte</u>	
	(Zip Code) <u>06949</u> <u>0-69469</u>	

☒ See attached sheet(s) for additional inventor(s) information!!

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Page 2

3.

Inventor's Signature:
Inventor:

Matthias Gerspach
Matthias
(first) MI

GERSPACH
(last)

Date: 20.04.2001

Germany
(citizenship)

Residence: (city)

Heidelberg

(state/country)

Germany

Mailing Address:

Husarenstrasse 9, Heidelberg, Germany

(Zip Code)

D-69121

106050-66028260